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Date	G.M.T.	Mag.	Remarks	Date	G.M.T.	Mag.	Remarks
July 17	16^h 55^m	3.7	Moonlight	Sept. 3	16^h 15^m	4.9	
18	17 0	3.8	"	4	16 0	4.85	
19	17 0	3.9	"	5	16 15	4.8	
21	17 20	4.7	"	6	16 10	4.7	
22	16 40	4.7	"	7	16 0	4.95	
24	17 15	4.1	"	8	16 20	4.95	
25	17 25	3.9	"	9	16 20	5.1	
26	16 40	3.9		10	17 0	5.0	Some cirrus
27	16 20	3.9		12	15 40	5.1	Thru clouds
30	17 30	4.1		14	16 40	4.95	Moonlight
Aug. 5	17 20	4.8		15	17 0	5.0	"
6	16 40	4.0		16	16 15	5.1	"
7	16 30	4.0		17	16 10	5.0	"
8	16 50	4.1		18	16 15	5.1	"
9	16 30	4.1		19	16 40	5.1	"
10	16 55	4.0		20	15 25	5.1	"
11	17 10	4.2		21	15 40	5.1	" ;scattered clouds
12	17 20	4.65		22	15 30	4.85	
13	16 50	4.7	Moonlight	23	15 20	5.0	
15	16 25	4.8	" ; thru fog	24	15 30	5.0	
16	17 0	4.8	"	29	16 30	5.1	Thru clouds
17	16 55	4.6	"	Oct. 1	15 50	5.0	Scattered clouds
18	16 30	4.5	"	13	16 20	5.3	
19	16 50	4.5	"	14	15 10	5.3	Moonlight
20	15 35	4.7	"	15	15 10	5.3	"
21	16 15	4.8	"	16	15 0	5.3	"
22	16 10	4.8	"	17	14 50	5.3	"
23	16 0	4.9	Sky covered with cirrus	21	15 10	5.4	
24	16 10	4.6		22	15 30	5.2	Thru clouds
25	15 45	4.7		25	15 10	5.4	
26	15 45	4.1?	Thru clouds	26	15 30	5.4	
27	15 30	4.4?	"	27	15 25	5.3	
28	17 0	4.5		30	15 10	5.3	
29	16 55	4.7		31	16 5	5.2	
30	17 30	4.9	Scattered clouds	Nov. 1	16 10	5.2	
31	16 40	4.9		5	15 0	5.2	
Sept. 1	17 10	4.9		8	15 10	5.1	
2	16 50	5.0		9	14 55	5.2	

MILTON HUMASON.

THE MOTION IN SOME A DOUBLE STARS

FOURTH NOTE

Three earlier notes[1] in these PUBLICATIONS have called attention to certain binary stars discovered in the Lick Observatory double-star survey which were shown to be in relatively rapid orbital motion by the measures made at a later epoch. The work of remeasuring the A double stars was continued during the year 1918 and many additional pairs were found in which the angular change since discovery was too great to be attributed to error of measure. The following list includes the more interesting of these pairs.

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[1] *Publ. A. S. P.*, **27**, 230, 1915; **28**, 276, 1916; **30**, 69, 1918.

Star	Δ Epoch	Δθ	ρ Disc.	Δθ	Mags.
A 207	16.7 yrs.	+31°.9	0″.24	+0″.02	9.7— 9.8
A 222	16.2	−31 .7	0 .23	−0 .01	8.6— 8.8
A 889	14.1	−46 .7	0 .24	−0 .03	9.4—10.0
A 893	13.9	−37 .4	0 .20	+0 .04	8.9— 9.8
A 1095	12.9	+18 .7	0 .31	+0 .04	8.7— 9.3
A 1109	13.0	+18 .4	0 .63	+0 .18	7.7— 9.7
A 1404	11.7	−15 .8	0 .21	−0 .03	7.7— 8.1
A 1516	11.0	+86 .3	0 .16	−0 .01	7.9— 7.9
A 1627	11.0	+20 .3	0 .24	0 .00	8.6— 8.6
A 1844	9.0	+78 .8	0 .26	0 .00	7.3— 9.8
A 1851	10.1	+51 .6	0 .43	−0 .01	9.5—10.0
A 2100	8.8	−21 .2	0 .21	+0 .12	7.7— 8.3
A 2172	8.1	−12 .8	0 .19	0 .00	8.7— 9.3
A 1152	12.9	+71 .1	0 .19	0 .00	9.4— 9.6
A 1609	11.0	+29 .8	0 .40	+0 .01	8.5— 8.5
A 2095	8.7	−29 .5	0 .18	−0 .04	8.2— 8.2
A 2167	8.1	−34 .7	0 .21	−0 .05	9.0— 9.0

Measures on only one night each in 1918 were secured of the last four pairs entered in the table, but there is no question in any case of the fact of rapid motion tho additional measures may slightly alter the tabulated amount. A single measure in an intermediate year in the case of A 1152 confirms the motion; this is true also of A 2095, which forms the brighter component of Σ 2659. The fact of decided change in angle was noticed at the time of remeasuring A 1609 and A 2167 and the circle readings were therefore checked with special care.

The unusually large angular change in the pairs A 1516, A 1844 and A 1152 is noteworthy; the angular separation in the first of these is small, but since the two components are of equal brightness the pair is more readily measured than A 1844, in which the components differ greatly in brightness. Taking magnitude into account, the motion in A 1152 is more unexpected than that in either of the other pairs.

Another pair in the table which invites comment is A 1109. Nearly all the pairs tabulated here and in the three earlier lists have angular distances of one-third of a second of arc or less; the distance in this pair is not only much greater than the average but the measures indicate that it is increasing. A single measure in 1916 on a rather poor night supports this conclusion.

The remarkable change in A 519 was referred to in an earlier note[1]. Later measures confirm this and indicate a short revolution period. The record now stands as follows:

A 519

1903.04	273°.2	0″.39	3n
1916.20	180 ±	0 .10±	1n
1917.06	142 ±	——	1n
1917.81	125 .4	0 .13	1n
1918.99	76 .4	0 .14	1n

The pair is still a difficult one to measure.

Another pair listed in the same earlier note was measured again in 1918 and deserves further attention. This is A 1223, a triple system. My measures of the close pair are:

A 1223 AB

1905.53	48°.8	0″.14	3n
1915.79	9 .0	0 .16	1n
1916.54	5 .6	0 .15	1n
1918.60	344 .0	0 .15	2n

The measured distances do not accord with the indicated acceleration in angular motion; probably the first distance is a little too small, the last one somewhat too large; the fact of rapid motion, however, is beyond question. The third star, 14.5 magnitude, probably does not belong to the system, for my measures are:

A 1223 AB & C

1905.53	348°.8	1″.60	3n
1918.60	13 .0	3 .08	2n

These are consistent with a proper motion of the close pair of approximately 0″.14 annually in about 215°. The data I have been able to find in star catalogs do not suffice to establish such a motion tho the difference between the positions from Bessel's Zones and the Leipzig A. G. Catalog points to motion in the same general direction.

ROBERT G. AITKEN.

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[1] *Publ. A. S. P.*, **28**, 277, 1916.